E&MJ METAL AND MINERAL MARKETS

WEEKLY MARKET INFORMATION ISSUED BY THE PUBLISHERS OF ENGINEERING AND MINING JOURNAL

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THIS WEEK IN THE MARKETS...

- **Africa and USSR trouble copper market. Sales outside U.S. hit peak this week.**
- **Zinc alloy makers cut ¼c a lb. Pressure on SHG premium likely. Sales slow.**
- **USSR interested in Ghana power and aluminum. Lead sales good. Tin higher.**

COPPER—U.S. average 33c a lb delivered

Pricings of copper in the U.S. this week were fair and almost unchanged from last week. Pricings outside the U.S. were the highest since the third week of Sept. 1957.

The heavy sales outside the U.S. reflect in part the disturbed world political situation, especially the trouble in Africa. Reports from the Congo indicate that the Katanga area is not insulated from the trouble. Reports from Rhodesia also suggest that though the copper belt has not had as much trouble as other areas it too may be in for disturbances that could interfere with copper production or shipment. There are suggestions that copper, unrefined, is being stocked in Belgium.

Analysts seem to believe the Chilean strike will be settled soon. Anaconda made a "last offer" of a 50% raise including fringe benefits and the union wants 58%. They were due for a final meeting yesterday.

Copper Institute data for April show that deliveries outside the U.S. were at an extremely high rate (p 3). Nearly all records for output were broken. Stocks were almost unchanged with blister going down about as much as refined went up.

At the CABRA meetings Alvin Knoerr, editor of E&MJ and E&MJ M&MM said "the resource picture for copper is constantly improving." Elliot Bell, editor and publisher of BUSINESS WEEK, said the U.S. should take the lead in calling for a world economic conference such as the London Economic Conference of 1933.

LEAD—12c a lb N.Y.

Lead sales this week were 12,819 tons. So far this month sales are well ahead of April. April had been good. Reports are that battery makers have been buying better than other users. Buyers are certain the price will not drop and some feel it might rise.

ALUMINUM—primary pig 26c a lb; export 23¼c

The USSR is reported interested in the Volta river power and aluminum project. It has apparently made some offers to Ghana. Kaiser Engineers are already doing some development work for construction of the dam. Kaiser is heading the consortium that is to put up the bauxite, alumina and aluminum facilities. Total cost has been estimated at $170-million for the non-power work. The World Bank, U.S. Development Loan Fund and, perhaps, the Export-Import Bank have been interested, and a team from the first has just returned.

Alcoa's president, F. L. Magee, discussed disposal of the U.S. aluminum stockpile. It may have been a warning to firms that contemplate producing pig (p 12).

TIN—99.875c a lb, N.Y.

N.Y. prices moved up ½c during the week owing largely to dealer activity and the threatening international situation. Consumer buying is spotty. London fell £1.

ZINC—Prime Western 13c a lb East St. Louis

Zinc sales this week were down from last week. Sellers say this reflects continued reluctance by purchasers to maintain stocks though their business is at lower levels than they had expected.

The disturbances in the zinc price structure got renewed emphasis early this week. American Metal Climax knocked down the price for zinc die casting alloys by ¼c a lb. No. 3 had been 16½c a lb for large lots and No. 5 16¾c. They are now 16¼c and 16½c respectively. Other large producers have followed the drop in the quotation.

The cut was indicated as following price cutting by other sellers, especially the independent (non-integrated) alloy makers.

Some independent alloyers admit there was some discounting but they say it was not in significant amount. They suggest it was done by very small alloyers—"garage plant" operators. These sellers, they say, are unable to sell unless they can give a slight price advantage and their very low overhead permits them to sell at a small margin. In some cases the discounting by the small independents forced the larger independents to follow. Some factors say this had become widespread. But others say the industry has been living with it for several years and that it is normal. The independents are much irritated.

The spread between Special High Grade and No. 3 is now 1½c a lb. In the past a number of integrated producers of alloys have said this is sufficient relative to costs. Independents say they require at least 1¾c. In the past they have put pressure on those SHG zinc sellers who do not make the alloys, to sell SHG at a price low enough to permit them to get the 1¾c spread. Independents will again insist on this—pressure will be put on the SHG premium. Some independents still have SHG zinc they bought at the 1½c premium.

Some analysts have said expectation of this possibility has delayed buying for SHG zinc in the past few months.

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Anaconda Memo to Management

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Looks like ordinary wire, but it's new and rather special. Amzirc®—zirconium copper, Cu 99.88%, Zr .12%—combines high electrical conductivity (90 to 95% IACS at room temperature) and strength retention at elevated temperature in the aged condition. Tensile strength of zirconium copper cold worked 80% and aged is about 70,000 psi at 20 C—52,000 psi at 400 C in a short-time test. Naturally, it has attracted interest in the missile field. We just recently finished drawing a batch of .0179″ wire for testing as a conductor in some missile components, and now know that even smaller diameters can be made. We also know it has excellent hot- and cold-working characteristics. But we don't have all the answers yet—nor does anyone else. The reason we call it to your attention is that you may have a problem that won't wait until we can OK it as a completely proven product. Possibly we could work together in finding the answer. Our Metallurgical Department and mills are working with many copper alloys offering a variety of unusual property combinations. The answer might be Amzirc—or *Cunisil-837*, our copper-nickel-silicon alloy—or *Chromium Copper-999*—or *Leaded Nickel Copper-831*. All have a potential for special electrical applications.

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E&MJ METAL AND MINERAL MARKETS

WEEKLY MARKET INFORMATION ISSUED BY THE PUBLISHERS OF ENGINEERING AND MINING JOURNAL

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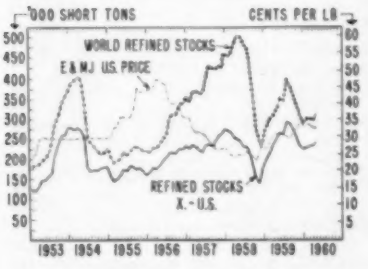
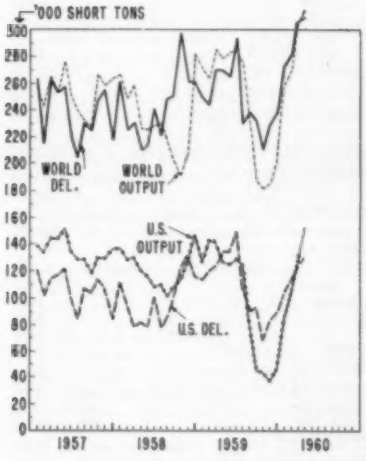
Copper Production and Stocks





Data, except price, are from the Copper Institute and are in thousands of short tons. They include April 1960. World refined output and stocks do not include the U.S.S.R., Japan, the Scandinavian countries, Yugoslavia, and the Mesina Mine in Transvaal. The series "X-U.S." are the above world stock statistics less the U.S. No fabricator stocks are included. Beginning with Jan. 1960 the C. I. includes data for mines formerly excluded.

Copper Output Again Sets Record

Copper Institute data again showed Free-World refined ouput at an all-time record in April. In March, it was for the first time over 300,000 short tons.

Copper Institute figures for March and April 1960 follow:

United States

Production:	Mar.	Apr.
Crude primary	(a) 107,514	104,010
Crude secondary	9,166	14,840
Total	(a) 116,680	118,850
Refined Copper	(a) 131,308	153,053
Deliveries Refined	(a) 126,776	129,663
Stock, end, ref'd	61,598	63,373

Outside United States

Production:		
Crude primary	(a) 199,550	197,188
Crude secondary	3,032	2,076
Total	(a) 202,582	199,264
Refined copper	172,195	173,538
Deliveries refined	(a) 180,796	188,984
Stock, end, ref'd	239,192	246,562

(a) Revised

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Bakken Elected CABRA President at Annual Meeting

G. P. Bakken was elected president of the Copper & Brass Research Association at the opening of its 38th Annual Meeting at The Homestead, Hot Springs, Va. Bakken, president of Chase Brass & Copper Co., succeeds James M. Kennedy, chairman of Revere Copper and Brass Inc.

Succeeding Bakken as senior vice president of CABRA is E. P. Dunlaevy, executive vice president of Phelps Dodge Copper Products Corp.

New vice presidents are: Richard M. Stewart, American Brass Co.; Lee Smith, National Copper & Smelting Co.; Joseph F. Murray, Reading Tube Corp.; S. T. Williams, Scovill Manufacturing Co.; and Richard H. Lewin, Cerro de Pasco Corp.

Vuillequez Forecasts Copper Lead and Zinc Use for 1970

Jean Vuillequez, vice president of American Metal Climax, said the consumption of nonferrous metals in the next decade is likely to increase greatly. In a speech before the National Federation of Financial Analysts Societies May 17 he said the U.S. Government at the end of WWII "embarked on a program to insure that in a global war we would have ample supplies of the three metals for a five-year war along the lines of WWII."

The U.S. Government then became a keen competitor in the metal buying business. It developed subsidies and other measures calculated to get out more metal. With this situation industry did not foster new uses.

The Government started to curtail its stockpiling. Powerful political pressures to stockpile more metal appeared, Vuillequez said.

Lead and Zinc Research Program

Lead and zinc producers came to realize that the only real solution was to increase consumption. So, he said, they formed the Expanded Research Program of the American Zinc Institute and the Lead Industries Assn. Already some encouraging results have appeared. Copper producers have recently formed the Copper Products Development Assn. with the same objectives as the lead and zinc groups.

Copper Consumption

Copper consumption increased in the Free World outside the U.S. during the period 1948 to 1959 by 84%, he said. In the U.S. the increase was only 5%.

"The consumption of copper for electrical purposes has continued to increase but the consumption for mechanical, ornamental and architectural uses in the U. S. has declined." It is in the latter area that much of the Association's efforts will be focused, he said.

"There are so many new uses which can add to copper's consumption — electronics, missiles, atomic energy, electric house heating." In the U. S., Vuillequez said, "The consumption of copper by 1970 may be about 40% greater than in 1959 . . . consumption outside the U. S. by 1970 may be 60% greater than in 1959."

Zinc Consumption to Grow

The continuous galvanizing lines have been important in zinc consumption. There are now 33 in the U. S. and two in Canada. Six will be brought into use in 1960. They are also being built in Europe. Galvanized sheet is "well competitive with substitute materials," he said.

New alloys for zinc may be developed that may make it more competitive for certain present uses. Die casting should grow in Europe.

In the Free World zinc consumption should increase by 55% by 1970, Vuillequez said.

Lead consumption has not increased in the U. S. since 1948. There have been losses in some industries particularly in cable covering. These have been offset

(Continued on page 4)

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Vuillequez *(Continued from page 3)*

by increases in gasoline and other uses. The losses he said have probably been arrested and gasoline and battery use of lead will probably continue to grow. The growth of consumption of lead in the Free World will be about 30% by 1970, Vuillequez said.

He pointed out the inadequacy of present statistics.

Russian Metal

In examining the future of metal markets, Vuillequez said the Communist bloc must be considered. "The big questions are whether they might be in a position now or later to dump these metals in the Free World or whether they may become buyers. We have noted that they have not been selling large quantities of lead and zinc and that they are buyers of copper." He said he had noted reports the "indication of which was fairly clear . . . that the Russians may need, chiefly at home, all of their industrial raw materials ranging from iron ore and petroleum to almost the entire field of nonferrous metals."

Magnesium Output Running Far Ahead of 1959

Primary production of magnesium was 3,520 tons in March, up 11% from February and 88% above March 1959, which was only 1,925 tons, the Magnesium Assn. has reported.

First quarter 1960 figures showed the same relationship with 10,055 tons produced exceeding fourth-quarter production by 5% but 82% above the 9,589 tons produced in 1959.

U.S. magnesium data in short tons:

	Shipments of wrought products	Primary ingot production
Mar. 1960	983	3,520
Feb. 1960	862	3,180
Mar. 1959	859	1,925
1st Qtr. 1960	2,613	10,055
4th Qtr. 1959	2,608	9,589
1st Qtr. 1959	2,589	5,527

U.S. shipments of magnesuim castings:

	Sand	Perm. Mold	Anodes	Die	Total
Feb. 1960	352	67	322	302	1,043
Jan. 1960	396	76	225	371	1,068
Feb. 1959	599	77	245	204	1,125

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Miscellaneous Metals

Wholesale lots, (a) f.o.b. ship. pt.; (b) delivered; (c) f.o.b. N.Y.; (d) Dep. on size of lot; (e) dep. on grade; (n) nom.

ALUMINUM: lb (b) eff. 12-17-59, ingot:
99.50%.....28.1c 99.80%.....29.1c
99.75%.....28.6c 99.85%.....30.1c

ANTIMONY: per lb; dom., May 12-18
boxed N.Y. (c) 32.590
bulk (a) ....29 boxed (a) 29.5
imported, 10 ton lots, 99%, N.Y., duty not paid
May 12 ....22¾-23 May 15 ....22¾-23
May 13 ....22¾-23 May 16 ....22¾-23
May 14 ....22¾-23
Import duty is 2c a lb. For 99½% metal add ½-¾c. For 99.6% metal add ¾-1c.

BERYLLIUM: 97%, (a), lb $71.50

BISMUTH: lb, ton lots $2.25

CADMIUM: lb (b) May 5-11
Ton lots, Eff. Jan. 7, 1960 .....$1.40
Less than ton lots $1.50
See Oct. 8, 1959, p. 12

CALCIUM: lb, ton lots, slabs, etc. $2.05

CHROMIUM: (b) lb of material,
exo. 98.5%, .05%C, ...(d)$1.15-1.19
Elec. 99.8% .....(d)$1.15-1.19
Vacuum melting .....4c more

COBALT: lb, (c), eff. 3-1-60
500 lb lots.....$1.50 100 lb lots.....$1.52
Less than 100 lb lots..$1.57 Fines..$1.50

COLUMBIUM: lb, 99½%, (d)
roundels ....$36 rough ingots $50

GALLIUM: gr, 1000-g lots $3.00

GERMANIUM: g
1000-g lots, 1st red .....29.5c(b)-30.15c(a)
intrinsic .....29.95c(b)-31.95c(a)
10,000-g lots, 1st red.....28.15c(a)-29.5c(b)
intrinsic .....29.95c(b)-29.95c(a)

INDIUM: tr oz, 99.9%, small lots $2.25
over 5,000 oz $1.35-2.25

IRIDIUM: tr oz $75-80

LITHIUM: lb 99.5% $9-11

MAGNESIUM: lb (a) 10,000 lb lots,
pig ingot 99.8% 35¼c-36.65c
notched ingot 36c-37.45c

MANGANESE: lb (b) 95½%, carloads,
bulk 45c
packed 45¾c
elec (a) frt. allowed E. of Miss., 99.9%..34c
ton lots eff. 4-1-57 .....36c
prem for hydrogen removed .....¾c lb

MOLYBDENUM: (a) eff. 8-56
powder, carbon red $3.35

NICKEL: lb (a) duty included 74c
eff. 12-6-56
dealers 74c
powder (b) U.S. 74c
sinter (nickel content) point of entry,
eff. 7-14-58 .....69.6c

OSMIUM: oz (n) $70-90

PALLADIUM: tr oz eff. 1-18-60....$24-26

PLATINUM: tr oz $81-85
average $82

QUICKSILVER: flask, N.Y. $212-15

RHODIUM: tr oz $137-40

RUTHENIUM: tr oz $55-60

SELENIUM: lb, 2-19-58, comm. grade $7
high purity $9.50

SILICON: lb (a) eff. 6-1-59
98% max. .51-1.0% Fe, crushed 20.85c
lump 19c
Hyper-pure: (4-1-57) #1.....$360
#2.....$250
#3.... .....$160
solar cell (4-1-57) .....$ 90

SODIUM: lb, carloads 16½c

TANTALUM: perlb,(a) (e) ,powder$30-58.60
sheet (e) $50.35-59.18
rod (e) $73.04-80.23

TELLURIUM: lb $3.50

THALLIUM: lb $7.50

TITANIUM: lb (a) A-1 99.3%
max. .15% Fe $1.60
max. .3% Fe. eff. 8-1-59 .....$1.50

TUNGSTEN: lb 98.8%
1000-lb lots .....$2.75-$2.90
Hydrogen red 99.99% $3.35-4.25
dep. on Fisher No. eff. 12-28-59

VANADIUM: lb, 90% V 100 lb lots..$3.45

ZIRCONIUM: lb (a) sponge, powder
platelets: low hafnium $7-14
comm.....$5-10

Metallic Ores

Tons of 2000 lb or units of 20 lb, unless otherwise stated. Short ton unit=stu; long ton unit=ltu. (a) c.i.f. U. S. ports, (b) f.o.b. ship pt., (c) f.o.b. mine or mill (g) depending on grade, (i) import duty extra, (n) nominal, (t) term contracts.

ANTIMONY ORE: stu of Sb:
50-55% ..... $2.25-$2.40
60% ..... $2.80-$2.90
65% lump ..... $3.30-$3.35

BERYLLIUM ORE: stu BeO, 10-12%
Dom. (c) – dep. on quan. ..... $46-$48
Imported (a), (t) ..... $34-$34.50
Spot (a) ..... $31.75-$32.50

CHROME ORE: lt, dry basis, subject to penalties if guarantees are not met, f.o.b. cars, Atlantic ports
Rhodesian: (t)
48% Cr_2O_3, 3 to 1, friable... (n) $35.75-$36.25
48% Cr_2O_3, 2.8 to 1 ratio..... (n) $32-$33.50
48% Cr_2O_3, no ratio..... (n) $27-$28
South African (Transvaal):
48% Cr_2O_3, no ratio..... (n) $25.50-$27
44% Cr_2O_3, no ratio ..... (n) $19.75-$20.50
Turkish (basis 48% 3 to 1):
48% Cr_2O_3, 3 to 1 ratio, lump and concentrates ..... (n) $36-$38
46% Cr_2O_3, 3 to 1 ratio, lump and concentrates ..... (n) $33.50-$34
Pakistan (Baluchistan):
48% Cr_2O_3, 3 to 1 ratio..... (n)

COBALT ORE: lb Co, free market
10% ..... (n) 80c
11% ..... (n) 70c
12% ..... (n) 80c

COLUMBITE ORE: lb pentoxide, 65% Cb_2O_5 and Ta_2O_5
Ratio 10:1 ..... $1.18-$1.25
Ratio 8½:1 ..... $1.05-$1.10

IRON ORE: lt, lower lake ports,
Lake Superior ore 1959:
Bessemer
Mesabi 51½% Fe..... $11.60
Old Range $11.85
Non-Bessemer
Mesabi 51½% Fe $11.45
Old Range $11.70
Eastern ores, ltu, delivered, foundry and basic, 56-62% ..... (n)
Swedish (t) (a) 60-68% stu (g)..... (n)
Brazilian (b) 68½% gross ton, premium for low P, 1-1-60..... $11.25
Smaller sellers $11

MANGANESE ORE: (a) (i) ltu.
Mn 46-48
Ind. Fe 10, P.15, Al+Si 13 ..... (n) 87c-90c
S. Af. Fe 9, P.05, Al+Si 13 ..... (n) 87c-90c
Mn 48-50, Braz. Fe 5, P.1, Al+Si 7, As .2 ..... (n) 91c

MOLYBDENUM ORE: lb cont, Mo.: 95% MoS_2 (b): (eff. 1.1.58)
Climax, cost of container extra..... $1.25
Molybdic trioxide MoO_3, bags (b).... $1.46
cans $1.47

TITANIUM ORE: Ilmenite, gross tons TiO_2, 59½% f.o.b. cars, Atlantic ports ..... $23-$26
54% f.o.b. cars ..... $21-$21.50
Rutile, 94% st, for del. within 12 mos. $80

TUNGSTEN ORE: stu WO_3 65% basis foreign ore, (i), nearby arrival
Wolfram ..... $19-$19.25
Scheelite ..... $19-$19.25
Low moly scheelite, higher
U.S. scheelite, stu. (c) ..... $24-$25
London, ltu, WO_3 good ore
Wolfram ..... 150s.

VANADIUM ORE: lb V_2O_5 cont (c):
Domestic 31c

ZIRCON ORE: (sand) lt. (a)
Atlantic:
65% ZrO_2 ..... $50
Domestic 66%, st, (b):
Jacksonville ..... no quote
Stark, Fla. $47.25

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BRASS: Cents lb (base prices)

33c base:	Sheet	Wire	Rods
Yellow Brass	50.57	50.86	50.26
Best quality brass	52.07	52.36	51.76
Red brass 80%	53.53	53.82	53.22
Red brass 85%	54.58	54.87	54.27
Com'l bronze 90%	56.17	56.46	55.86
Gilding metal	57.23	57.52	56.92

Eff. 11-16-59

COPPER: lb, f.o.b. mill, eff. 11-9-59
Sheet, over 20" 57.13c
Rolls, 20" & under 56.41c
Wire, bare, carloads 38.35c

LEAD SHEETS: lb, full rolled..... 17½c

MONEL: lb, base prices
Cold-rolled sheet $1.20
Cold-rolled strip $1.08
Rods, hot-rolled $0.89

NICKEL: lb, base prices
Sheet, cold-rolled $1.38
Rods, hot-rolled $1.07

NICKEL SILVER: lb
Sheets, 10% 65.86c
18% 70.49c
Wire, Rods, 10% 68.06c

PHOSPHOR BRONZE: lb
Sheet, 5% Sn 77.44c
Wire, rods, 5% 78.19c
10% 84.93c

ZINC: lb, base prices, carloads, f.o.b. mill
Sheet 26c
Ribbon 21½c
Plates 20c

ZINC DIE CASTING ALLOY: lb, ingot
carloads, del. 5-16-60
No. 3 ..... 16¼c
No. 5 ..... 16½c

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U.S. Lead and Zinc Imports

Imports of lead and zinc for the second quarter of 1960 were the following, in short tons, at about 3:30 pm May 17, according to data from the U.S. Customs Bureau.

Lead Ore

Country	entered	quota
Australia	filled	5,040
Canada	filled	6,720
Peru	4,939	18,440
Bolivia	2,470	2,520
U. of S. Africa	filled	7,440
Other	2,718	3,280

Lead Metal

Country	entered	quota
Australia	10,203	11,840
Canada	2,915	7,960
Peru	1,169	6,440
Mexico	7,472	18,440
Yugoslavia	7,153	7,880
Other	filled	3,040

Zinc Ore

Country	entered	quota
Canada	filled	33,240
Mexico	27,070	35,240
Peru	8,640	17,560
Other	filled	8,920

Zinc Metal

Country	entered	quota
Canada	7,105	18,920
Mexico	1,041	3,160
Peru	651	1,880
Bel.-Lux.	718	3,760
Bel. Congo	1,047	2,720
Italy	788	1,800
Other	1,061	2,040

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lead
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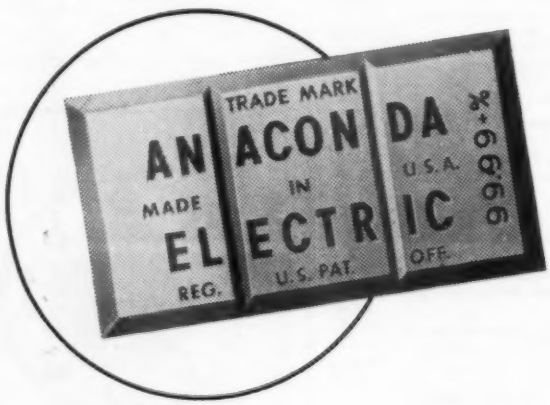

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WATCH THESE TRENDS

UP TO 2% BORON 10 ISOTOPE in a new Type 304 stainless steel provides high neutron absorption and excellent mechanical properties, reports The Carpenter Steel Co., Reading, Pa. Boron increases tensile and yield strength, but cuts ductility, impact strength and corrosion resistance. The enriched boron isotope makes up for the negative qualities of the basic metal. The alloy will be used for control rods, burnable poison and nuclear reactor shielding.

MAGNESIUM TOOLING PLATE, square and round tube and sheet are being used in jigs, fixtures and templates by Lockheed Aircraft Corp., Marietta, Ga. A part of the tooling program for the JetStar utility transport is included. Light weight, flatness, dimensional stability, rigidity and machinability were characteristics instrumental in the metal's selection, according to DOW METAL PRODUCTS NEWS.

TITANIUM, a metal initially developed to reduce the weight of airplanes, has been used by the U.S. Army to build its latest man-portable recoilless weapon, the Davy Crockett. The Army reports that the use of titanium has resulted in the saving of 80 lb, enough to release an infantryman for other duty. The metal's resistance to corrosion will permit the weapon to be stored indefinitely. Titanium Metals Corp. estimates need for 1,000 tons of metal for the project over the next five years.

A PIECE OF PYROLITIC GRAPHITE considered the world's largest has been produced by the General Electric Research Laboratory. The material, which has aroused great interest because of its ability to withstand extremely high temperatures, is used for missile nose cone heat shields, rocket engine nozzles and missile steering vanes. Industrially, it is used in hot pressing dies, in melting crucibles for metals, ceramics, semiconductors and nuclear reactors. The GE piece is ⅛ in. thick, 17 x 31 in.

CERAMIC FIBERS COMBINED WITH METAL which result in super strengths have been disclosed by Horizons Inc., Cleveland. The company considers a metal alloy made up of 80% nickel and 20% chromium composition and an inorganic fiber of aluminum oxide of sapphire or corundum single-crystal form as the best bet. A weight reduction is also achieved in this alloy formation needed for landing gears, fittings and propulsion assemblies in air and space craft.

STRIPS OF STAINLESS STEEL ALLOY tissue paper thin, wound layer upon layer, are helping contain the tremendous force developed in rocket engines fueled by solid propellants, according to Alleghany Ludlum Steel Corp. Multiple strips of ultrahigh-tensile AM-355, a precipitation hardening stainless steel, were wound then spotwelded into a cylindrical rocket chamber that withstands 305,000 psi hoop stress.

SUPER PURITY ALUMINUM, called Raffinal by Aluminum Foils Inc., the country's major producer, is used in electrolytic capacitors, chemical processing, in catalysts for high octane gasoline and in metal refining. The company, which outproduces all other domestic plants combined, will double its capacity with completion of a plant addition at Jackson, Tenn. Raffinal has little structural strength because of its high purity and is alloyed with magnesium to give the mechanical benefits of other aluminum alloys.

VANADIUM PENTOXIDE is the least expensive main constituent as a catalyst for vehicle smog-control units. Its use will assure a rapidly-increasing demand for vanadium, reports Minerals Engineering Co. of Grand Junction, Colo., a company which has signed a 5-year contract for the full by-product vanadium production of the Minerals Products Division of Food Machinery and Chemical Corp. of New York City. The move followed the California Legislature's recent action requiring anti-smog devices on all cars and trucks. Pentoxide for the state's 7-million vehicles would amount to about 40,000 tons—more than six times the nation's current output. Minerals Engineering will produce vanadium pentoxide from the by-product vanadium. Coincidentally, AEC will open bids on 750 tons of pentoxide, stored at Grand Junction, on May 23.

VERMICULITE, KNOWN AS BLACK MICA, mined for use as a soil conditioner and building material, is not only edible, but might reduce the dangers of radioactive contamination in the human body, reports the Illinois Institute of Technology. As a food additive in bread, the mineral could limit the recycling of such high-fission yield products as cesium and rubidium. It is effective in eliminating radioactive contaminants. While not impairing vitamin assimilation, it will reduce calories for the control of obesity.

AN ALUMINUM SUBSTRUCTURE is the major component in an airborne oil drilling rig that can be dissembled into packages for transport by helicopter or cargo plane. Designed by Ideco Division of Dresser Industries and Reynolds Metals Co., the substructure weighs about 15 tons, a saving of 60% over a steel base unit. The unit will be used for exploratory drilling in Central Bolivia.

AMSULF, a free-machining alloy consisting of 99.7% OFHC copper plus 0.3% high-purity sulphur, offers a machinability rating of 90, hot and cold workability approximately that of unalloyed OFHC and electrical conductivity of 96% IACS, Amco Division of American Metal Climax Inc. reports.

A 25% SOLUTION OF BECCO AMMONIUM persulfate, followed by a warm water rinse produces an unusually clean surface on copper, Becco Chemical Division of Food Machinery and Chemical Corp., Buffalo, has announced. The surface, free of oxides, will not reoxidize quickly and substantially reduces the porosity of thin electrodeposits. Details of the new copper preparation may be obtained from Becco, Station B, Buffalo 7, N.Y.

A NEW TUNGSTEN ARC process for cutting stainless steel called Heliarc-Cutting, which has been publicized by Steel Warehousing Division of Jessop Steel Co., Broadview, Ill., results in smoother edges that can be welded upon immediately. Grinding is minimized as is discoloration and distortion, the company said. No significant alteration of corrosion resistance on the cut edge was reported.

A ZINC MARKET POTENTIAL of 100,000 tons may be the result of American Zinc Institute's research project aimed at development of an economical process for production line welding of galvanized steel—of prime importance to the automotive industry. The objective is to develop techniques which will permit production welding at the same rate and on a similar maintenance basis as presently employed in welding uncoated steel strip.

No. 5 of a series about

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E&MJ QUOTATIONS

Daily Prices of Metals

May	COPPER ELECTROLYTIC Domestic Refinery	Export Refinery	Europe c.i.f.	LEAD New York	LEAD St. Louis	ZINC (b) Delivered (a)	ZINC (b) East St. Louis	ALUMINUM Primary Pig 99.5% U.S. dest.	ALUMINUM Primary Pig 99.5% Export	TIN Straits New York
12	32.600	30.350	31.295	12.000	11.800	13.500	13.000	26.000	23.250	99.375
13	32.600	30.225	31.170	12.000	11.800	13.500	13.000	26.000	23.250	99.625
16	32.600	29.725	30.670	12.000	11.800	13.500	13.000	26.000	23.250	99.500
17	32.600	29.800	30.745	12.000	11.800	13.500	13.000	26.000	23.250	99.625
18	32.600	29.975	30.920	12.000	11.800	13.500	13.000	26.000	23.250	99.875
Averages	32.600	30.015	30.960	12.000	11.800	13.500	13.000	26.000	23.250	99.600
Calendar Wk. Avgs.										
May 9-13	32.600	30.405	31.350	12.000	11.800	13.500	13.000	26.000	23.250	99.275

(a) Prime Western Zinc sold on delivered basis at centers where freight from East St. Louis exceeds one-half cent a pound.

The above quotations are our appraisal of the major United States markets, based on sales reported by producers and their agencies. They represent payments received by producers for the product. They are reduced to the basis of cash, New York or St. Louis, as noted. Prices in cents per pound.

Copper, lead and zinc quotations are based on sales for prompt and future deliveries; aluminum weighted average prices are based on estimated sales and announced prices; tin quotations are for prompt delivery only.

COPPER prices, domestic, in the trade are quoted on a delivered basis, that is, delivered at consumer's plants. Delivery costs vary with the destination. The above prices are net prices at the refineries; the average shipment cost is deducted in order to arrive at a refinery price. Beginning Jan. 2, 1957, the average differential between delivered and f.o.b. prices is taken as 0.400c per lb.

COPPER quotations, foreign or export, reflect prices obtaining in the open market and are based on sales in the foreign market reduced to the f.o.b. refinery equivalent, Atlantic seaboard. On f.a.s. transactions, eff. Jan. 2, 1957, we deduct 0.125c for lighterage, etc., to arrive at the f.o.b. refinery quotation.

COPPER, Europe, c.i.f., is the export refinery quotation with the addition of the lighterage figure 0.125c, and freight to main Continental ports, 0.82c.

COPPER quotations are for ordinary forms of wirebars and ingot bars. The premiums on special shapes, effective in some instances on deliveries beginning Sept. 1, 1955, are: Standard ingots 0.25c per pound; slabs 0.55c and up, cakes 0.6c and up, depending on weight and dimensions; billets 1.725c and up, depending on dimensions and quality. Discount on cathodes 0.125c to 0.15c per pound.

ZINC quotations reflect sales of the Prime Western grade as well as sales of other grades when sold on a Prime Western basis. (b) **Zinc premiums . . .** obtaining over Prime Western zinc in the East St. Louis market on the following grades, in cents per pound: **Selected 0.10c; Brass Special 0.25c; Intermediate 0.5c, High Grade** zinc sold on contract, delivered to the consumers' plants, commands a premium of 1½c per lb for current sale and delivery, Apr. 1, 1960, over the East St. Louis basis for Prime Western. **Special High Grade** premium or differential is 1½c per lb for current sale and delivery, beginning Apr. 1, 1960.

LEAD quotations are for the common grade, and are based on sales of domestically refined metal sold to domestic consumers. The differential on sales in the Chicago district is 15 points under New York; for California 20 points under New York; for New England add 7½ points to the New York basis. Corroding grade commands a premium over common lead of 10 points.

ALUMINUM quotations refer to primary pig, 99.5% in cents per pound. The U.S. price is delivered to buyers' plant; it includes sales by Canadian producers. The export price is the price at which U.S. primary producers sell c.i.f. (delivered) foreign ports. The quotations are weighted averages with the weights determined by the relative capacity of the producers. Ingot sales reduced to the pig price are included in determining the price. The premium on standard ingots is 2.1c per lb.

Note: The daily quotations for copper, lead and zinc are weighted averages of sales reported to *E&MJ;* weekly averages are arithmetical averages of the daily quotations; monthly averages are the arithmetical averages of the daily quotations.

Silver, Gold, and Sterling Exchange

May	Silver N.Y.	Silver London	Sterling Exchange	London Gold (a)
12	91.375	79.375d	280.6660	250s. ¾d.
13	91.375	79.375d	280.6880	250s. ¾d.
16	91.375	79.375d	280.5520	250s. 1d.
17	91.375	79.375d	280.3466	250s. ⅝d.
18	91.375	79.375d	280.5660	250s. 2½d.
Av.	91.375	—	280.564	—
Calendar Wk. Avgs.				
May 9-13	91.375	—	280.678	(a) Open Market

The daily silver quotation reported by Handy & Harman, in cents and fractions of a cent per troy ounce, is the price paid by Handy & Harman in settlement for silver contained in unrefined silverbearing materials submitted to them for refining. It is determined on the basis of offers of bar silver .999 fine as made to Handy & Harman for nearby delivery at New York by regular suppliers in quantities sufficient to meet daily requirements, and it is usually one quarter cent below the price at which such offers are made.

The Treasury's purchase price of newly mined domestic silver was established at 90.5c per troy ounce, 1000 fine, effective on July 1, 1946 under an amendment to the Silver Purchase Act of July 6, 1939.

London silver quotations are in pence per troy ounce, basis .999 fine.

London gold quotations are per troy ounce, basis 1000 fine.

Sterling, in cents, noon buying rate for cable transfers as certified by the Federal Reserve Bank of New York, for customs purposes.

Aluminum Alloys Secondary May 12-18

	Tons	Price/lb
No. 13	17	25.57c
No. 43	27	26.22c
No. 360	36	25.75c
No. 380		
1% Zn	605	25.01c
2% Zn	52	24.75c
3% Zn	99	24.28c

The secondary aluminum alloy prices are weighted average prices calculated from reports by secondary aluminum producers of the prices and quantities of their sales.

London Metal Exchange

May	COPPER Cash Bid	COPPER Cash Asked	COPPER 3 Mo. Bid	COPPER 3 Mo. Asked	LEAD Current Month Bid	LEAD Current Month Asked	LEAD 3 Mo. Bid	LEAD 3 Mo. Asked	ZINC Current Month Bid	ZINC Current Month Asked	ZINC 3 Mo. Bid	ZINC 3 Mo. Asked	TIN Cash Bid	TIN Cash Asked	TIN 3 Mo. Bid	TIN 3 Mo. Asked
12	249	249¼	243½	244	77⅞	77¾	76½	76½	91¾	92	91⅜	91⅝	786½	787	785½	786
13	243	243½	239½	240	78¼	78½	76⅝	76⅝	91	91¼	91½	91¾	784½	785	784	784½
16	242½	243	239½	239¾	77⅞	77½	76½	76¾	91¼	92	91⅜	91⅝	783	783½	782½	783
17	244	244¼	240¼	240½	77⅞	77¾	76¾	76⅞	92	92½	91⅜	91⅝	785	785½	784½	785
18	248½	248¾	244½	244¾	77¾	77⅞	77	77¼	92	92¼	91⅜	92	785½	786	785½	786

Prices are for the official a.m. session in pounds sterling per ton of 2240 lb. Copper basis electrolytic and fire refined wire bars, lead 99.97%, zinc 98% and tin min. 99.75%.

THIS WEEK'S BUSINESS INDICATORS

	Latest Week	Preceding Week	Month Ago	Year Ago	Net Change Year Ago
Steel Rate (% of capacity in operation)	(d) 71.7	(a) 73.8	82.7	97.7	−26.0
Steel Ingot Production, thousands of tons	(d) 2,042	(a) 2,102	2,238	2,644	−602
Automobile Production (cars and trucks)	(d) 191,114	(a) 181,626	169,653	172,659	+18,455
Electric Power Output (millions kwh.)	13,139	13,300	13,494	12,659	+480
Engr'g Const. Awards, 4-week daily av., in thousands (c)	$79,470	90,316	83,556	70,752	+$8,718
Federal Reserve Index of Industrial Production (b)	109 Apr.	....	109	107	+2
E&MJ Index of Nonferrous Metal Prices (e) (f)	125.8 Apr.	....	125.9	120.1	+5.7
All Commodities, Bureau of Labor Statistics (e)	(a) 120.0 Apr.	....	120.0	120.0	....

(a) Revised. (b) Base (100), 1957. (c) From Eng. News-Record. (d) Preliminary. (e) Base (100) 1947-1949. (f) Weights 1922-24.

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SCRAP METALS, and RESIDUES

Heavy Ore Shipments Swell March Lead Imports

U.S. lead imports in March rose to near the 1959 monthly average, according to American Bureau of Metal Statistics figures.

The month's total of 34,919 was 8,000 tons above the February mark owing to a 6,000-ton increase in ore arrivals.

U.S. lead exports were 40 tons of refined and five tons of ore, little changed from the 53 reported the previous month, but down from the 1959 average of 240.

Bureau of Census figures, in short tons:

	1960		
	Jan.	Feb.	Mar.
Ore:			
Canada	3,474	3,665	3,301
Bolivia	474	...	1,544
Chile	...	...	1,172
Peru	2,619	1,243	4,419
South Africa	4,475	2,070	4,950
Australia	3,200	1,966	1,210
Others	915	2,432	3,588
Total	15,157	11,376	17,184
Bullion:			
Peru	12	20	8
Others	...	3	...
Refined:			
Canada	1,957	1,797	3,173
Mexico	7,653	8,912	4,745
Peru	1,211	100	4,867
Spain	...	903	972
Yugoslavia	...	2,305	3,970
Others	9,032	1,494	...
Total	19,854	15,511	17,727
Total imports	35,023	26,910	34,919

Zinc Imports Highest of Year; Exports Exceed '59

U.S. zinc imports in March were the highest of the year, running about 2,500 tons above the 1959 monthly average, the American Bureau of Metal Statistics has reported.

The 57,072 tons reported for the month were about 2,500 tons greater than February, with gains in ore and refined arrivals about equal.

Exports for the year have in three months exceeded 1959. Refined zinc totaling 5,878 tons arrived during the month, a surge upward from February. The 1959 monthly average was about 1,000 tons; the yearly average, 11,637 tons.

Bureau of Census figures, in short tons:

	1960		
	Jan.	Feb.	Mar.
Ore:			
Canada	10,709	11,363	9,386
Mexico	14,324	20,129	14,535
Honduras	775	795	894
Bolivia	15	...	756
Peru	5,255	4,295	11,874
Spain	3,870	2,951	5,901
South Africa	499	3,513	1,051
Others	565	238	553
Total	36,012	43,284	44,950
Refined:			
Canada	6,386	6,312	5,942
Mexico	384	309	2,744
Peru	351	680	698
Belgium	552	413	1,077
Belgian Congo	55	1,323	1,177
Others	1,227	440	484
Total	8,955	9,477	12,122
Total imports	44,967	52,761	57,072

Heavy Blister Imports Lift March Copper Arrivals

U.S. copper imports were 52,436 tons in March, up about 5,500 tons from February, according to data released by the American Bureau of Metal Statistics.

Both crude and refined figures were down from the previous month; but blister, largely from Chile, nearly doubled pushing the month about 4,000 tons above the 1959 monthly average.

Brass and wire mill product imports were down about 1,000 tons from February to the 1959 monthly average.

Copper exports in March were the highest of the year — 22,347 tons — about 50% higher than the 1959 average.

Bureau of Census import figures, in short tons:

	1960		
	Jan.	Feb.	Mar.
Ore:			
Canada	3,710	1,484	1,862
Cuba	...	938	1,221
Chile	1,140	2,097	625
Philippines	...	2,760	2,534
South Africa	1,030	1,777	1,162
Others	1,366	843	852
Total	7,246	9,899	8,256
Blister:			
Mexico	...	2,538	1,145
Chile	17,925	10,081	17,862
Peru	1,765	1,312	3,997
South Africa	1,220	...	3,213
Others	597	284	1
Total	21,507	14,215	26,218
Refined:			
Canada	12,556	9,864	12,756
Mexico	551	441	441
Chile	2,235	600	650
Peru	3,078	2,320	1,441
Spain	2,756	2	1,444
Sweden	1,717	397	454
Rhodesia	1,610	3,724	395
Others	9,617	5,251	381
Total	34,120	22,599	17,962
Total imports	62,873	46,713	52,436

Imports of copper products in short tons:

	1960		
	Jan.	Feb.	Mar.
Brass Mill:			
Copper in —			
Rolls, sheets, rods	3,560	2,749	1,885
Tubes, tubing, seamless	1,811	2,039	2,074
Brass rods, sheets, plates, bars, strips	1,494	1,721	1,468
Brass tubes, tubing, seamless	780	953	912
Brass wire	247	122	170
Total	7,892	7,584	6,509
Wire Mill:			
Copper wire	731	670	475
Total products	8,623	8,254	6,984

U.S. copper exports, in short tons:

Ore	53	809	1,108
Refined:			
France	1,746	2,594	4,133
West Germany	3,491	4,844	6,022
United Kingdom	1,721	2,917	4,229
Japan	2,173	2,621	2,804
Argentina	...	440	917
Italy	845	3,288	954
Others	1,361	2,325	2,180
Total	11,337	19,029	21,239
Total exports	11,390	19,838	22,347

British Copper Rolling Mill Claimed to be World's Largest

London (McGraw-Hill World News): The new copper rod rolling mill at Prescot, Lancashire for British Insulated Callender Cables Ltd. is claimed to be the largest and most modern in the world.

Officially opened this week, normal annual output of the $4.2-million mill will be about 100,000 long tons of copper rod, representing 75% of the entire U.K. output for cable-making, for which all the raw material will come from Rhodesia. Only 17 men are needed to operate the plant which was designed and built by BICC and the Brightside Foundry and Engineering Co. Ltd.

•

Aluminium Sales and Income Jump in First Quarter

First quarter sales and operating revenues for Aluminium Ltd. and consolidated subsidiaries amounted to $124,632,000, the company reported today, up 31% from $95-million, in the corresponding period of 1959.

Cost of sales and operating expenses increased to $81,971,000 for the first three months of this year, compared to $62,908,000 in the first quarter of 1959.

Consolidated net income for the three months ending March 31 was $8,804,000 or 29c per share compared to $2,310,000 or 8c per share for the 1959 period, which was the lowest quarter in recent years. Consolidated sales of aluminum in all forms were, as previously reported, 180,000 tons compared with 124,000 tons in the first quarter of 1959.

Aluminum Company of Canada Ltd, whose accounts are consolidated with those of Aluminium Ltd., reports a net income of $4,861,424 for the first three months of 1960, compared to a net loss of $913,106 during the 1959 first quarter.

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Cadmium Oxide	*Molybdenum Concentrates*	*Zinc*
Cadmium Sulfide	*Nickel Salts*	*Zinc Dust*
Copper		*Zinc Sulfate*

ASARCO

AMERICAN SMELTING AND REFINING COMPANY
120 BROADWAY, NEW YORK

Mineral and Ore Markets

Letters of acceptance have gone out to the "lucky ones" on the big Indian manganese ore barter. They were about as indicated here Feb. 25, 1960.

There are still some uncertainties. The amount of ore that will have to be taken above that needed for the stockpile has not yet been determined. The handling of the cotton in connection with the payment of freight also needs to be arranged more precisely.

Not all successful bidders are happy about this barter.

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The Turkish chrome barter is off — but probably only temporarily. CCC rejected all bids. Some report there was wavering by CCC. It may ask for bids again soon.

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Alcoa President Says Profits Not Good in Mill Products

Frank L. Magee, president of Alcoa, said, "From our vantage point at the threshold of the Sixties, we view the coming decade as one which offers both challenging problems and rewarding opportunities." Magee spoke at a meeting Tuesday to the Nonferrous Metals Forum of the National Federation of Financial Analysts' Societies.

"In the past 10-year period," he said, "the size of the industry and the intensity of competition have increased sharply as growing markets demanded more metal."

In the U.S. and Canada combined there is still about 465,000 tons of idle capacity, he said. Of this about 386,000 is in the U.S. High inventories of metal have adversely affected sales of aluminum during the first five months of 1960. Imports have been a problem, Magee said. In the last five years pig imports rose from 178,000 tons to 239,500 and mill products from 20,972 to 55,350 tons. He said expansions already undertaken by foreign producers as well as those being planned are aimed largely at the North American markets.

He said, "Although it is obvious that the Government will ultimately have to dispose of the stockpile surplus, our industry is naturally concerned that the disposition of the surplus aluminum be accomplished on an orderly basis and in such a manner as to minimize adverse affects on the general market."

Magee said there is "currently an unfavorable price structure from the standpoint of profits, particularly for semi-fabricated and mill products."

"From the long term standpoint," Magee said, "none of the basic aluminum producers has any great concern about over-supply."

Important prospects for increased aluminum use lie with the expected population growth and increasing per capita use outside the U.S. The latter explains largely why the U.S. aluminum companies "are turning their attention abroad." But plants there depend not only on bauxite and low cost electrical energy — skilled manpower, adequate capital and convenient markets must also be considered, he said.

He indicated that one of the elements that accounted for the high development of the aluminum industries in the U.S. was its political stability. There was no reference to this in his remarks about the development of aluminum industries abroad.

As we enter the new decade there is no reason why the great growth of the past should not continue, he said.

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DeLonge Promoted by Inco

Kenneth A. DeLonge has been appointed manager, direct sales in the Primary Nickel Department of The International Nickel Co.

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London Copper Prices

The following prices in £ sterling per long ton c.i.f. European ports are calculated by the London Metal Bulletin (see M&MM Feb. 13, 1958, p 3).

May 9	250.482	May 12	250.037
May 10	250.235	May 13	247.367
May 11	251.476		
Av.	249.919		

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Brass and Bronze Ingot

85-5-5-5 (No. 115) 29¼c; 80-10-10 (No. 305) 33¾c; 88-10-2 (No. 215) 38¾c; Yellow (No. 405) 23¾c and upward; Manganese bronze (No. 420) 27¼c.

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Tri-State Concentrates

Joplin, May 17, 1960

(a) Blende	Per Ton
Prime coarse (60% zinc)	$80
Flotation, 60% zinc	$80

(a) Effective Jan. 8, 1960

Galena	
Coarse and flotation, 80% lead	(a) $141.72

(a) Effective Dec. 21, 1959

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Lead Average (Monterrey)

The net price realized by the American Smelting & Refining Co. on all of its sales of Mexican pig lead, including metal sold for consumption in Mexico, during the week ended May 14, 1960, was 9.17c (U.S. per lb f.o.b. refinery) Monterrey, Mexico.

Dealers' Scrap Prices

Dealers' buying prices, f.o.b. New York or equivalent freight points, for wholesale quantities, in cents per lb.

No. 1 copper wire	24–24½
Heavy copper & wire, mixed	21–21½
Light copper	18¾–19¼
No. 1 composition	16¾–17¼
Composition turnings	15¾–16¼
Light brass	10½–11
Yellow brass turnings, mix	11–11½
Heavy yellow brass, mixed	11½–12
Auto radiators, unsweated	12¾–13
Brass pipe, cut	13½–14
Rod brass turnings, No. 1	12–12½
Rod ends, brass	12–12½
New soft brass clips	14–14½
Cast aluminum, mixed	11–11½
Aluminum crankcases	11–11½
Aluminum clips, new soft	15–15½
Sheet aluminum, old clean	11–11½
Aluminum turnings, clean	6–6½
Zinc die cast, mixed	2–3
Zinc die cast, new	4¼–4½
Old zinc	4–4½
New zinc clips	7–7¼
Soft or hard lead	8¼–8½
Battery plates	3–3¼
Babbitt mixed	9½–10
Linotype or stereotype	9–9½
Electrotype	8–8½
Solder joints close cut	13½–14
Block tin pipe	78–79
Autobearing babbitt	40–41
Monel Clips, new	28–29
Monel sheet, clean	24–26
Nickel, rod ends	52–54
Nickel, clippings	52–54

Smelters' Copper Scrap Prices

Custom smelters' buying prices for scrap, carload lots, refinery:

No. 1 copper and wire, 26½c; No. 2 heavy copper, 24¼c; light copper, 22c; refinery brass, 22¼c.

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A Custom Smelter Copper Price May 12-18

The following prices are computed by M&MM from data on flat price and average price sales reported by the American Smelting & Refining Co. They refer to electrolytic copper in standard shapes.

Delivered consumers' plants	32.750c
F.O.B. refinery	32.350c

They are for sales in the U.S. market and are adjusted to the nearest one-eighth cent. A ¼c deduction for selling commission has been made.

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Ferroalloys Unchanged

N.Y. Commodity Exchange

	COPPER					LEAD				ZINC				TIN			
	May		July			May		July		May		July		May		July	
May	Bid	Asked	Bid	Asked	C	Bid	Asked	Bid	Asked	Bid	Asked	Bid	Asked	Bid	Asked	Bid	Asked
12	31.38	31.38	29.35	29.35	93	11.45	11.50	11.60	11.63	11.40	11.50	11.58	11.60	•	•	•	•
13	31.10	31.10	29.07	29.07	361	11.45	11.50	11.60	11.65	11.45	11.47	11.60	11.62	•	•	•	•
16	31.15	31.15	29.09	29.09	232	11.40	11.50	11.55	11.65	11.45	11.48	11.57	11.60	•	•	•	•
17	31.90	31.90	29.68	29.68	526	11.45	11.50	11.60	11.65	11.48	11.55	11.60	11.65	•	•	•	•
18	31.92	31.92	29.60	29.60	594	11.45	11.50	11.60	11.65	11.45	11.55	11.55	11.65	•	•	•	•

•Trading suspended.

Closing quotations on the N.Y. Commodity Exchange in cents per lb. C is number of contracts traded for the seven months of the year for which the Exchange accepts trading. Each contract is for 25 tons. Where bid and asked prices are the same, closing quotation was one at which transactions occurred.